A Revision of the Carangid and Seriolid Fishes of New Zealand.

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(Plates 18-24.)

The recent changes in generic and specific names of the *Carangidae,* together with some uncertainty as to the identity of some of our species, have indicated the need for a revision of the New Zealand members of the family, in preparing which an attempt has also been made to distinguish New Zealand from closely related Australian forms. Fresh specimens of all the local species have been examined, including a satisfactory series of the trevally; the latter exhibits a considerable degree of variation among individuals from the same locality, which indicates the need for careful consideration before establishing new species on slight differences in fin formula or even in body proportions.

I wish to acknowledge the assistance afforded me by Mr. Archey, Director of the Auckland Museum, and by Mr. G. Whitley, of the Australian Museum, and to thank Professor R. Speight, Curator of the Canterbury Museum, Mr. J. J. Enwright, Marine Superintendent of Sanford's, Ltd., and Messrs. Deighton and Shirley, of the Auckland Fishermen's Co-op., for supplying specimens for examination.

Key to the New Zealand genera of *Carangidae* and *Seriolidae.*

A.	Caudal peduncle with a series of enlarged bony scutes on the lateral line	i. Fam. *Carangidae*
B.	Lateral line armed along its whole length ..	1. *Trachurus*
BB.	Lateral line armed on part only of its length	
C.	Dorsal and anal fins each with a detached posterior ray	2. *Decapterus*
CC.	Posterior dorsal and anal rays not detached..	3. *Usacaranx*
AA.	No bony scutes on caudal peduncle	ii. Fam. *Seriolidae*
D.	Caudal peduncle with a keel on each side ..	4. *Naucrates*
DD.	Caudal peduncle without lateral keels.. ..	5. *Regificola*

It may be mentioned here that *Evistius* Gill, orthotype *Platystethus huttoni* Guenther, has been included in the New Zealand list of Carangids by various writers.

After having examined a specimen, I am satisfied it does not belong to this family at all, but is included in the family *Labracoglossidæ,* referred to by McCulloch, 1923, Rec. Austr. Mus., Vol. xiv., No. 2, p. 121, and by Jordon, 1923, Class. Fish., Vol. iii., No. 2, p. 203.

Genus TRACHURUS Rafinesque.

Key to the New Zealand species:—

A. Depth 4.7 to 5.2 in the length; more than 73 scutes on the lateral line. Body rather robust .. .. .. 1. *novae-zelandiae*

B. Depth 4 to 4.4 in the length; less than 73 scutes on the lateral line. Body rather depressed .. .. 2. *declivis*

Trachurus novae-zelandiae Richardson.

Horse Mackerel, *Hature.*

(Plate 18.)

1843. *Trachurus novae-zelandiae* Richardson, 12th Rep. (year 1842) Brit. Assn. Adv. Sci., p. 21.
1872. *Trachurus trachurus,* Hutton, Cat. Fish. N. Zeal., p. 16, pl. 3, fig. 23 (not *T. trachurus* Linn).*
1911. *Trachurus picturatus,* Waite, Rec. Cant. Mus., vol. 1, p. 232 (not *T. picturatus* Bowdich).
1915. *Trachurus novae-zelandiae* Hutton, McCulloch, Biol. Res. Endeavour, vol. 3, p. 123.**
1921. *Trachurus novae-zelandiae* Cuv. and Val. Phillipps, N.Z. Journ. Sci. and Tech., vol. 4, p. 117.
1927. *Trachurus novae-zelandiae* Richardson, Phillipps, N.Z. Marine Dept. Fish. Bull., No. 1, p. 34.

Br. 6. D. viii/I/XXXIV.; A. ii/I/XXX.; P. XXV.; C. xvi/3-3; V. i/V.

Depth before second dorsal rather more than 4.24 in the length from the premaxillary symphysis to posterior margin of middle caudal rays; head 3.97 in same. Eye 4.28 in head and 1.56 in snout. Adipose eyelid 1.75 in the eye. Pectoral nearly 4 in the length and subequal with the head.

Body elongate, robust, the dorsal and ventral profiles nearly subequal, the back being a little flattened at base of first dorsal fin.

Snout long, pointed, lower jaw slightly the longer. Two nostrils close together about the middle of snout. Maxillary reaches or extends very slightly beyond the vertical from the anterior border of eye. Adipose eyelid moderately developed. Scales are present on top of head as far as anterior margin of eye, on cheeks, operculum and maxillary, the snout preorbital and lower jaw being naked.

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*In his original description Richardson credits this species to Cuvier and Valenciennes, Hist. Nat. Poiss. ix., p. 26; but although there is a description therein of "Le Saurel de la Nouvelle-zelande" there is no binomial designation.

Hutton in his synonymy (1872) also includes *T. novae-zelandiae* C. & V., no doubt through copying Richardson, and Phillipps (1921) has repeated this attribution.

**McCulloch credited the name *novae-zelandiae* to Hutton because, as he states, "I have failed to find any reference to it" [in Cuvier and Valenciennes]. He was apparently unaware of Richardson's description.

Minute teeth present in both jaws in a single series, those in the lower jaw being the more developed; teeth also present on the vomer, palatine bones and tongue. Gills, 4; gill-rakers 30 on the lower half of the anterior limb.

Body covered with moderate cycloid scales completely covering the breast. Lateral line commencing at upper margin of operculum gradually curving downward to beneath the fifth-sixth rays of the dorsal, thence straight to caudal. I count 93-95 scutes in my specimen, the largest being considerably greater than the eye. Three small procumbent spines, deeply embedded in the skin, precede the dorsal fin. Third dorsal spine longest. Anterior rays of both dorsal and anal longest, very gradually decreasing backward, the last again becoming much longer and separated by moderately deeply excised membrane; both fins are protected by a very low scaly sheath. Pectoral subfalcate, reaching backward as far as the vertical from the space between the first and second dorsal. Caudal moderately forked. Origin of ventral below middle of base of pectoral and at great distance from the vent.

Colour: Above lateral line dark greenish-blue, below scutes paler, with a golden hue, blending into creamy-white on the ventral surface. Dorsal fin *terra vert* colour. Pectoral, caudal and anal greenish yellow. Ventrals, pinkish-white.

Described and figured from a specimen which is 429 mm. from the pre-maxillary symphysis to posterior margin of middle caudal rays. Greatest height, 100 mm.; eye, 25 mm.; caudal peduncle width, 15 mm.

Locality and Distribution: Auckland Harbour, and occurring in large shoals in open sea on the east and west coasts of the North Island. Hutton (1872, loc. cit.) states it is common in Wellington Harbour about the end of November, and that he noted a few on the west coast as far south as Martin Bay. Waite (1907) recorded it from the Bay of Plenty to Palliser Bay, in depths ranging from 13 to 94 fathoms. It is also found in Australian seas. It is regarded as an oceanic species, which sometimes enters inlets in shoals.

Affinities: This species is often mistaken for *T. declivis*, but a glance at the illustrations accompanying this paper will show the differences, which, though slight, are constant. *T. novaezelandiae* is a much more robust fish and grows to a greater length, also the scutes of the lateral line are broader and more numerous than any I have seen in *T. declivis.* The latter is also lighter in colour, with the dorsal and ventral profiles more evenly convex. Specimens in the Auckland Museum.

Trachurus declivis (Jenyns).

Herring Scad. (Plate 19.)

1841. *Caranx declivis* Jenyns, Zool. Beagle, iii., p. 68, pl. xiv.

1915. *Trachurus declivis*, McCulloch, Biol. Res. "Endeavour," vol. iii., pt. 3, p. 125, pl. xxxiv., fig. 2.

Br. 7; D. ii/VIII/I/XXX; A. ii/I/XXVII; V. i/V; P. i/XXI; C. XVIII.

Height of body 4.04, head 3.75 in the length to the hypural joint. Eye 4.06 in the head, and subequal with interorbital width, or nearly 1.41 in the snout. Caudal peduncle .75 in the width of the eye. Maxillary sub-equal with the caudal peduncle.

Body oblong, somewhat compressed, the dorsal and ventral profiles almost evenly arched, covered with small deciduous scales. Similar scales are also present on the preorbital, maxillary, cheeks, operculum, and lower jaw, but the top of the snout is scaleless.

Lateral line continuous, formed of numerous scutes, about 70 in the entire length. It follows a gradual curve from the upper angle of the operculum as far as the vertical of the anterior portion of the second dorsal, it then bends acutely downwards, after which it becomes a little larger at the bend, largest below the middle of the second dorsal, thence getting gradually smaller again to the end of the peduncle. Head with the interorbital convex; there is a small mesial ridge anteriorly. Two nostrils high up on the profile, slightly higher than the upper edge of the orbit, and situated rather nearer the eye than the tip of snout. Maxillary reaches the anterior margin of the orbit. A narrow band of minute teeth in both jaws; teeth are also present on the vomer and palatine bones, while the tongue is provided with a broad mesial ridge of granular teeth. Gills, 4; gill-rakers long, about 38 on the lower half of the anterior limb.

Fins: In front of the first dorsal there are two very minute detached spines directed forward, difficult to find, as they are almost wholly embedded in the skin; these are followed by eight high spines, the third of which is highest, nearly equal to two of the eye; the first ray is longest, subequal with the fifth spine, thence the rays get rapidly shorter backwards. Anal similar to the second dorsal. There is a moderate notch in the membrane separating the last rays in both fins. Pectoral falcate, reaching the vertical of the second ray of the dorsal. Caudal deeply forked, the two lobes equal.

Colour: Pale yellowish-green silver above lateral line, shot with cobalt; scutes, yellowish-green; below lateral line, silver white reflecting pale blue. Head the same as body, but there is a diffused black spot on the posterior upper angle of the operculum; maxillary pale greenish-white; eye gold and silver with the pupil blue-black. First dorsal with clear very pale greenish spines, the membrane between transparent; second dorsal clear transparent at base, bright yellowish-green on margin. Anal, uniform greenish-white. Pectoral, same as anal. Ventral, transparent light horn colour, the base of the rays tinged with dull red. Caudal similar to the second dorsal.

Described and figured from a specimen which is 25 mm. long from the symphysis of the lower jaw to the hypural joint. The greatest height is 63 mm., length of head 69 mm., eye 17 mm.

Locality and Distribution: Auckland Harbour. The species is very common in waters of the Auckland Provincial District; large hauls are frequently obtained by trawlers operating out of Auckland at all seasons of the year.

It is also reported to be abundant in Port Jackson, and it occurs all round the coasts of the southern half of Australia, from South-western Australia to Southern Queensland.

Genus DECAPTERUS Bleeker.

Decapterus koheru (Hector). *Koheru.* (Plate 20.)

1874. *Caranx koheru* Hector, Trans. N.Z. Inst., vol. 7, p. 24, pl. XI., fig. 24a.

1921. *Decapterus koheru,* Phillipps, N.Z. Journ. Sci. Tech. vol. 4, p. 117.

Br. 6. D. vi/I/XXIX/I; A. ii/I/XXVIII/I; P. i/XXII; V. i/V; C.viii/3-3.

Depth before second dorsal 3.90 in the length from premaxillary symphysis to posterior margin of middle caudal rays. Head 3.81 in same. Eye 4.14 in head or 1.45 in snout, and 2 in second dorsal spine. Adipose eyelid 2 in the eye. Body elongate, robust, the dorsal and ventral profiles subequal. Snout long, pointed, lower jaw longest. Two nostrils in very close proximity to each other, situated about midway between premaxillary symphysis and anterior border of eye. Maxillary reaches the vertical from anterior margin of orbit. Adipose eyelid moderately developed. Scales present on cheeks, operculum, and on top of head as far as anterior border of eye. Snout, maxillary, lower jaw and the interoperculum are naked.

Teeth very minute, in a single series in both jaws, also present on vomer, but I do not find any on the palatine bones. The tongue is roughened. Gills, 4; gill-rakers long, slender, 34 on the lower half of anterior limb. Body covered with very small scales which completely cover the breast. Lateral line commencing at upper angle of operculum is moderately straight as far as the vertical from the second dorsal ray, it then dips steeply downward for a short distance to below the fifteenth ray, from thence it is straight to caudal. There are 26 keeled scales on the posterior portion, none of which is very large, broadest about the middle of the peduncle, about 4 in the eye.

Above the orbit, there is a long hardened ridge with a very much shorter one immediately behind. These appear to be a long, followed by a short procumbent spine, firmly embedded in the skin. There is also a much shorter and very thin one just before the first dorsal. Second spine of dorsal longest. Anterior rays of both dorsal and anal longest, those near the middle of the fins shortest. Both fins are concave near the centre, broadening out again gradually towards the posterior rays, which are almost as long as the anterior. Both fins protected by a very low scaly sheath. Pectoral subfalcate reaching backward nearly as far as hinder margin of first dorsal. Caudal moderately forked. Ventral origin below middle of base of pectoral and at a great distance from vent.

Colour: Above lateral line dark bluish-green silver, below lighter with a golden hue, ventral surface somewhat paler. All fins uniform yellowish-green, the tips rather darker, excepting the ventrals, which are pinkish white. Upper part of head same as dorsal; cheeks and opercles same as body below lateral line. A small round black spot on hinder margin of operculum. Eye golden and blue-black.

Described and figured from a specimen which is 350 mm. long from premaxillary symphysis to posterior of middle caudal rays. The depth of the body before the second dorsal is 89 mm., head 90 mm., eye 23 mm., caudal peduncle 13 mm.

Locality and Distribution: Auckland Harbour, and common in all waters of the Auckland Provincial District, from Cape Maria to East Cape. Fishermen inform me it is abundant about the entrance to Whangarei Harbour and the Hauraki Gulf, where large shoals are often observed. Although a fine table fish, it is seldom seen in any large quantities in our local fish markets. Specimen in the Auckland Museum.

The New South Wales species, *D. leptosomus,* is said by Ogilby (Proc. Linn. Soc. N.S. Wales, 1898, p. 760) to differ greatly from *D. koheru.*

The former appears to be a very much smaller species, rarely exceeding 170 mm. in length. There is also a greater number of spines in the first dorsal, 8 as against 6 in *D. koheru,* while the upper jaw in *D. leptosomus* is toothless.

Before proceeding with the descriptions of the trevallys, it is important to note the change in the generic name of the New Zealand and Australian species proposed by Whitley, who does not advise the retention of *Caranx,* that genus now being restricted to the genotype, *Caranx carangus* (= *hippos)* Linne, an American species with the breast naked, except for a central patch of scales. The New Zealand and Australian forms have the breast wholly scaly.

Whitley proposed the name *Usacaranx* (1931), for *Caranx nobilis* Macleay, and for all species of the group with scaly breasts.

The generic and specific synonymy is as follows:—

Genus USACARANX Whitley, 1931.

Longirostrum. Jordan, 1923, Classif. Fishes, p. 185, ex Wakiya MS., orthotype *Caranx platessa* C. et V. (Not *Longirostrum* Wakiya 1924), Ann. Carnegie Mus. XV., pp. 164 and 202, in strict sense, i.e., for Selenia, preocc. = *Usa* Whitley 1927, Rec. Austr. Mus. XV., p. 299, orthotype *Caranx (Usa) cordylaoides* (Meuschen). Both preoccupied by *Longirostra* C. T. Wood 1835, Orn. Guide, p. 203, and *Longirostris* S. D. Wood 1836, Analyst iv., April, 1836, p. 119, genera of birds, *fide* Sherborn, Ind. Anim.

Usacaranx. Whitley 1931, Austr. Zoologist, VI., Feb., 1931, p. 316, orthotype *Caranx nobilis* Macleay.

Key to the N.Z. species of *Usacaranx*.

Pectoral elongate, falcate, caudal deeply forked, body without vertical bars ..	1. *lutescens*
Pectoral much shorter, sub-falcate, body with eight broad vertical bars ..	2. *archeyi* n. sp.

Usacaranx lutescens (Richardson).

School Trevally; *Araara*. (Plate 21.)

1843. *Scomber lutescens* Richardson, Jan., 1843. Ann. Mag. Nat. Hist. XI., p. 26, ex Solander MS. New Zealand. Mar. 30, 1770.

1843. *Scomber micans* Richardson, Jan., 1843, Ann. Mag. Nat. Hist., XI., p. 27, ex Solander MS. "prope Motuaro," Queen Charlotte Sound, New Zealand.

1843. *Scomber platinoides* Richardson, Jan., 1843, Ann. Mag. Nat. Hist., XI., p. 28, ex Solander MS. Tolaga, New Zealand.

1843. *Caranx lutescens* and *platinoides* Richardson, 1843, "Travels in New Zealand" (Dieffenbach) ii., p. 210, ex Solander MS. New Zealand.

1848. *Caranx georgianus* Richardson, Zool. Voy. Erebus and Terror, Fish, p. 135. (Not *C. georgianus* Cuv. and Val., 1833, from West Australia.)

1911. *Caranx platessa* Waite, Rec. Cant. Mus. i., p. 233. (Not of Cuv. and Val.), 1833, from "La mer des Indes" (Peron).

1927. *Longirostrum platessa* Phillipps, Bib. N.Z. Fishes, i., p. 33, (Not *Longirostrum* of Wakiya, nor *platessa* of Cuv. and Val.).

Mr. Gilbert Whitley in a letter points out "that the earliest specific name that can with certainty be applied to our School Trevally is *Scomber micans* Richardson (ex Solander MS.), described from a specimen secured by Capt. Cook's expedition, but a brief Latin description having page priority is named *Scomber lutescens* in Richardson's paper, and as no other Neo-zelanic Carangid appears to fit in with this description, the specific name *lutescens* must be given priority over all others."

"It is probable that *Caranx platessa* and *Caranx georgianus* are synonymous, or closely allied, but they cannot be regarded as New Zealand species, as Peron (who was never in New Zealand) collected the type, probably from South Australia, but no definite locality was assigned to it."

A well graduated series of 26 fresh specimens in fine condition, ranging from 298—700 mm. long, has been critically examined.

In this series the following variations were recorded:—

Head, from 3.4 to 3.68 in the length of the fish; depth of body, 2.9 to 3.27; pectoral, 2.67 to 3.18 in the same. Eye in head, 4.9 to 6.83. Eye in snout, 1.7 to 1.85. Scutes of the lateral line number from 25-29, counting those only plainly visible to the eye.

The dorsal fin, in two cases, I count 8/24, three cases 8/25, seventeen of 8/26, and four of 8/27. The anal fin in all cases was 2/1/23.

The position of the ventrals is subject to considerable variation; in five cases the tips of the rays touch the vent; in sixteen cases it is near the vent, while in five specimens it is rather far from the vent.

The variations recorded have no relation to size, neither do the fish fall into groups; all were taken in the Auckland Provincial waters, and I cannot but regard them as all of one species.

The size of these trevallys, when schooling, ranges from 200-400 mm. long, and they are usually found in deep water a little distance from the coast, many acres being covered at a time by fish of this size. I have never seen very large trevallys among the school fish, and experienced fishermen have informed me they are not found among them. The large fish are more frequently met with in deep water bays and around rocky headlands, where I have observed them living in moderately large communities. These large fish are generally in fine condition, with the top of the head much more elevated than in the smaller and younger specimens, although their form cannot be considered gibbous; beyond this character, they are in every other way like the smaller school fish.

Locality and Distribution: From the Three Kings Islands to the Hauraki Gulf and all intermediate outlying islands in from 16 to 28 fathoms. Waite (1907) records it from the Bay of Plenty to Cape Palliser, in 16 to 68 fathoms, while Thomson, Trans. N.Z. Inst., XXIV., p. 208, gives Puysegur Point as its southern limit, but I have no other record of its being taken so far south, and question whether it extends much beyond Cook Strait.

Solander (1843) gives Queen Charlotte Sound as the locality for his specimen, and I have just received reliable information from Mr. D. H. Graham, late of the Portobello Marine Biological Station at Port Chalmers, that the Trevally is not found in Otago waters. This seems to confirm my own opinion that Cook Strait and Queen Charlotte Sound may be regarded as its southern limit in New Zealand. According to Phillipps (N.Z. Journ. Sci. and Tech., Vol. 1, No. 5, 1918, p. 271), the spawning season for the species is in January and February.

Specimens in the Auckland Museum.

The New South Wales Trevally *Usacaranx nobilis* (Macleay) differs from *Usacaranx lutescens* principally by its possession of very minute teeth, greater number of scutes on the lateral line, the gibbous form of the head, and, according to Macleay, the absence of the opercular spot.

Usacaranx archeyi n. sp. (Plate 22.)

Br. 8; D. viii/I/XXVII; A. ii/I/XXII; P. i/XIX; V. i/V; C. xix/6-6 = xxxi.

Height before second dorsal 3 in the length from the premaxillary symphysis to posterior margin of middle caudal rays.

Head 3.18, pectoral 7 in same. Eye 4.71 in head, and 2 in snout. Interorbital width rather greater than the eye, and subequal with snout. Body moderately elongate-ovate, compressed, dorsal and ventral profiles evenly curved. Snout of moderate length, the upper jaw slightly the longer. Maxillary reaching to vertical of midway between nostrils and eye. Adipose eyelid undeveloped.

Whole of head covered with very small scales. Minute villiform teeth, widely separated in both jaws. Teeth are also present on the vomer and palatine bones, the latter almost microscopic. Tongue covered in minute granular teeth. Gills, 4; gillrakers, 23, very long and slender, on lower half of anterior limb.

Body entirely covered with small scales. Lateral line evenly arched to the vertical from the seventh-eighth dorsal rays, thence straight to caudal. There are about 37 finely keeled scales on the straight portion of lateral line, broadest below the posterior half of second dorsal, the broadest scales being about three-quarters the width of eye.

A procumbent spine deeply embedded in skin at base of first dorsal spine. The third and fourth spines are longest, reaching the second dorsal when adpressed.

Anterior dorsal rays much longer than those following, provided with broad lobes. Pectoral reaches backward to the vertical from the second ray of dorsal. Ventrals reach as far as the first anal spine. Anal fin subequal with the dorsal. Caudal moderately forked.

Colour: Silvery, with thin greenish shade over all, darker along dorsal. Eight slightly darker vertical bars nearly as wide as eye reach from top of back to ventral surface, but do not extend on to fins. A black spot on upper posterior margin of operculum.

All fin rays and spines same colour as the back, the membrane between thin, clear, colourless, but having a number of microscopic dots near the outer margin.

Variation and Dimensions: I have examined six examples of this fish, the largest being 103 mm. long from the premaxillary symphysis to the base of middle caudal rays. Greatest depth is 36 mm.; head, 34 mm.; eye, 8 mm. The smallest specimen is 73 mm. long; depth, 25 mm.; head, 24½ mm.; eye, 6 mm.

In every other way the large and small specimens do not differ from the type specimen.

Locality: Several specimens taken in beach trawl on the northern side of Motuihi Island, Hauraki Gulf, in May, 1928, by Mr. Gilbert Archey, Director of the Auckland Museum, after whom I have named the species.

These are the first of their kind brought to my notice, and as it has not been recognised since, I am inclined to think it is not common.

Holotype and *paratypes* in the Auckland Museum.

SERIOLIDAE.

Genus NAUCRATES Rafinesque, 1810.

Naucrates angeli Whitley (Plate 23). Pilot Fish.

1872. *Naucrates ductor* Linn., Hutton, Cat. Fish. N.Z., p. 18.

1927. *Naucrates indicus* Linn., Phillipps, N.Z. Marine Dept. Fish. Bull., No. 1, p. 34.

1931. *Naucrates angeli* Whitley, Austr. Zoologist, vol. 6, pt. 4, p. 316.

Hitherto, our Pilot Fish has been considered identical with the Atlantic species, but Whitley points out that the young forms figured by McCulloch (Rec. Austr. Mus., XV., 1926, 34) differ markedly from Atlantic juveniles of *Naucrates ductor* recently figured by Roule and Angel (Res. Camp. Sci. Monaco fasc: lxxix., 1930, 86, pl. V., figs. 111-114). Whitley therefore considers our Southern Pilot Fish to be a new species.

Br. 7; D. iv/I/XXX; A. ii/I/XVII; V. i/V; P. i/XX; C. xv/3/3.

Height of body equal to the length of head, or 3.87 in the length to the hypural joint. Eye 4.86 in the head, and 1.57 in the snout. Pectoral subequal with ventral, and about $1\frac{3}{4}$ in the head. Maxillary $1\frac{3}{4}$ in the eye.

Body oblong, subcylindrical, the dorsal and ventral profiles equally curved. Whole of body covered with small cycloid scales. A band of similar scales present on the cheeks, reaching as far as the upper posterior border of the orbit and at the top of the operculum, while the top of the head, maxillary, lower jaw and preoperculum are naked. Lateral line continuous, arched above the centre of pectoral, thence gradually sloping to the vertical of middle of dorsal, it then becomes straight to the caudal. Caudal peduncle with a moderate keel, the latter naked on its outer margin. There is a small scaly sheath at the anterior portion of the second dorsal, which ends below the eighth ray. A similar sheath at the anterior part of the anal, ending above the base of the sixth ray. Head, with the inter-orbital and nape strongly convex. Two nostrils close together, nearer the tip of snout than the eye, the posterior a small slit-like aperture pressed close to the anterior, which is oval, surrounded with a low cutaneous rim. Operculum strongly striated and notched on its upper posterior border. Preoperculum also striated, strongly denticulated on its posterior margin, but the denticulations become finer on its lower border. Maxillary does not nearly reach to the anterior margin of the orbit. Villiform teeth in a band in both jaws, those in the lower being in a broader band than in the upper jaw; there are also a few longer hooked teeth, mostly found in the lower jaw. Teeth on the vomer, palatine bones and tongue. Mouth oblique, the jaws equal when closed. Gills 4, gill-rakers long. Seventeen on the lower half of the anterior limb, the points of each furnished with minute spines on their inner margins. First dorsal with four small spines, with a very low membrane attached to each; the rays are highest anteriorly, but decrease rapidly in height backwards. Two very minute spines are situated close in front of the anal, the rays being similar to those of the dorsal, but much lower. Origin of anal at the vertical from the 13th dorsal ray. Ventral reaches backwards almost to the vertical from the second dorsal ray. There is a depression on the abdomen into which the ventral fits when laid back.

Colour: Above lateral line, deep bluish-silver, below, bright bluish-silver, the bands being deep prussian blue. Top of head same colour as the bands. Cheeks and opercles pale bluish-silver. Dorsal fin uniform dark bluish-black, the tips of the anterior rays being faintly margined white. Anal similar to the dorsal, but with rather more white at the tips of the first three or four rays. Caudal somewhat paler than the dorsal, and with a broad blackish band crossing both lobes near the margin, the tips white. Pectoral dull white, with a dusky patch. Ventrals dusky silver white.

Described and figured from a specimen which is 26 mm. long from the tip of snout to the hypural joint. The greatest height is 69 mm., head 64 mm., eye 11 mm.

Variation: In the specimen here described and figured, a male, it will be noticed that the upper caudal lobe is much greater than the lower. In all other specimens I have seen, also figures and descriptions, I have found the caudal lobes to be equal. I am not able to say whether the unequal lobes in my specimen may be due to a deformity, or perhaps a sexual difference. A fine female specimen received shortly after this one was captured has both the lobes equal, and, on further comparison, I find there is no other variation except in the colour, the female being somewhat brighter, and with much more white showing in the dorsal and anal fins.

Locality and Distribution: Red Mercury Island, Auckland, Nov., 1925. This fish was gaffed while the fishermen were engaged in landing a big mako shark. Two other specimens (one of which was brought to the Museum) were captured in shallow water in the Hauraki Gulf in October, 1926. It is also known from New South Wales.

Specimens in the Auckland Museum.

Genus REGIFICOLA Whitley, 1931.

Regificola grandis (Castelnau, Plate 24). King Fish. *Haku.*

1872. *Seriola grandis* Castelnau, Pro. Zool. Acclim. Soc. Victoria i, July, 1872, p. 115.

1872. *Seriola lalandi,* Hutton, Cat. Fishes N.Z., p. 17 (not *Seriola lalandi* Cuv. and Val.).

1907. *Seriola lalandi,* Waite, Rec. Cant. Mus. Vol. 1, No. 1, p. 23 (not *Seriola lalandi* Cuv. and Val.).

1915. *Seriola grandis,* McCulloch, Biol. Res. Endeavour, Vol. 3, p. 121, pl. 35, fig. 1.

1927. *Seriola lalandi,* Phillipps, N.Z. Marine Dept. Fish. Bull. No. 1, p. 34 (not *Seriola lalandi* Cuv. and Val.).
Seriola grandis, Phillipps, Trans. N.Z. Inst. 58, p. 128, p. 4.

1931. *Regificola grandis,* Whitley, Austr. Zoologist. Vol. 6, pt. 4, p. 316. Orthotype *Seriola grandis* Castelnau.

The New Zealand King-fish is now regarded as identical with the Australian species, for which Whitley (1931, p. 316) has founded a new genus.

For a number of years our King-fish has been confused with the Atlantic species *Seriola lalandi* of Cuvier and Valenciennes, but recent examinations of the two show that our King-fish differs from the Atlantic form principally in its being a much more slender species, with the upper profile of the head less convex. Another character which appears to be constant is the maxillary, which, in the Atlantic species, reaches fully to the middle of the eye, while in the New Zealand and Australian forms it extends to, or a trifle beyond, the anterior margin of the eye.

In three examples before me, two of which are of the average size of 1,040 mm., and a small specimen of 350 mm. long, I get exactly the same fin formula, viz.:

D. vii/I/XXXIII; A. ii/I/XXI; P. i/XX; V. i/V; C. XVII.

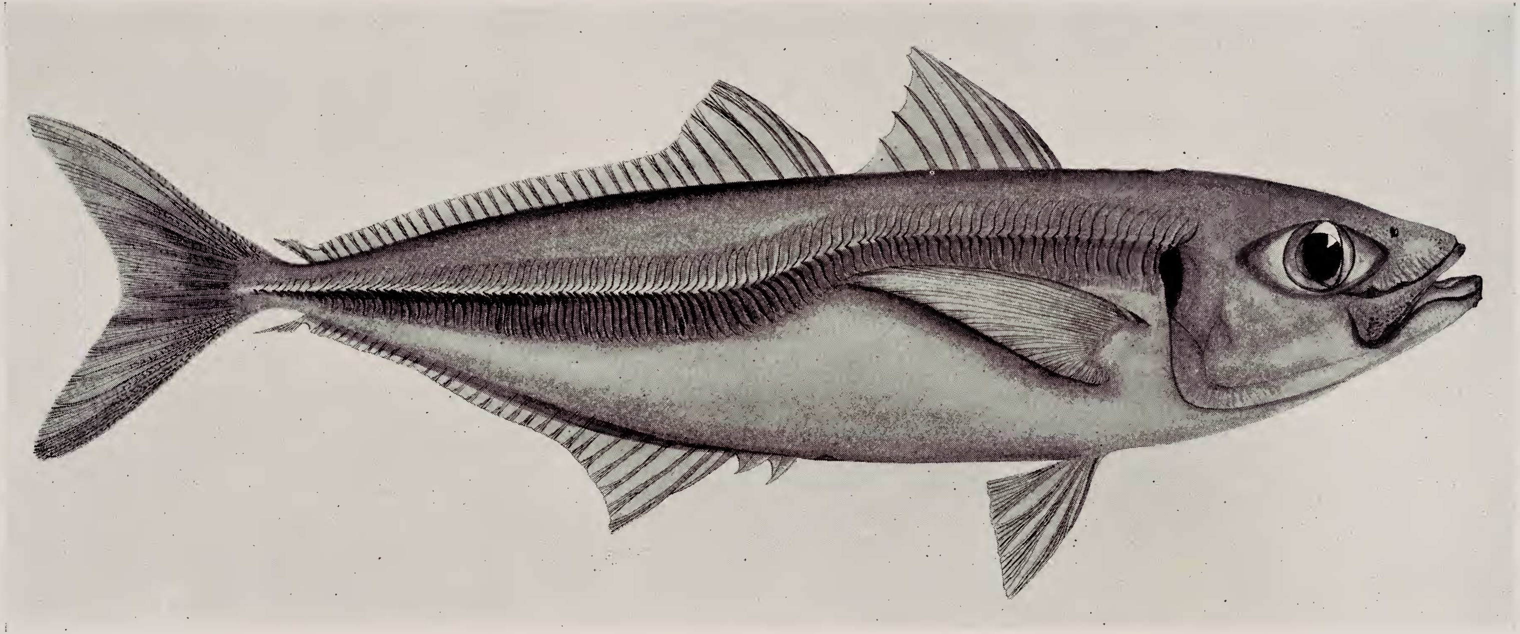
In the largest specimen the head is 3.62 in the length from the pre-maxillary symphysis to the base of the middle caudal rays, while the depth below the first dorsal is 4.48 in the same.

In the small specimen of 350 mm. long, the head is 4.07 in the length and the depth 4.38 in the same. These measurements agree very well with Australian examples, where the head ranges from 4.37 to 4.71, and the depth 4.6 to 5.17, according to the size of the fish.

According to Phillipps (1927, p. 129), the head ranged from 4.24 to 4.66, and the depth 4.3 to 4.79. It will be readily observed that the dimensions vary considerably according to the age and condition of the fish.

Distribution: Very common and growing to a large size in all waters of the Auckland Provincial District, from the Three Kings Islands to the Bay of Plenty. Said to be less plentiful in Cook Strait, and rare about Otago. Also well known in Australian seas.

Specimens in the Auckland Museum.

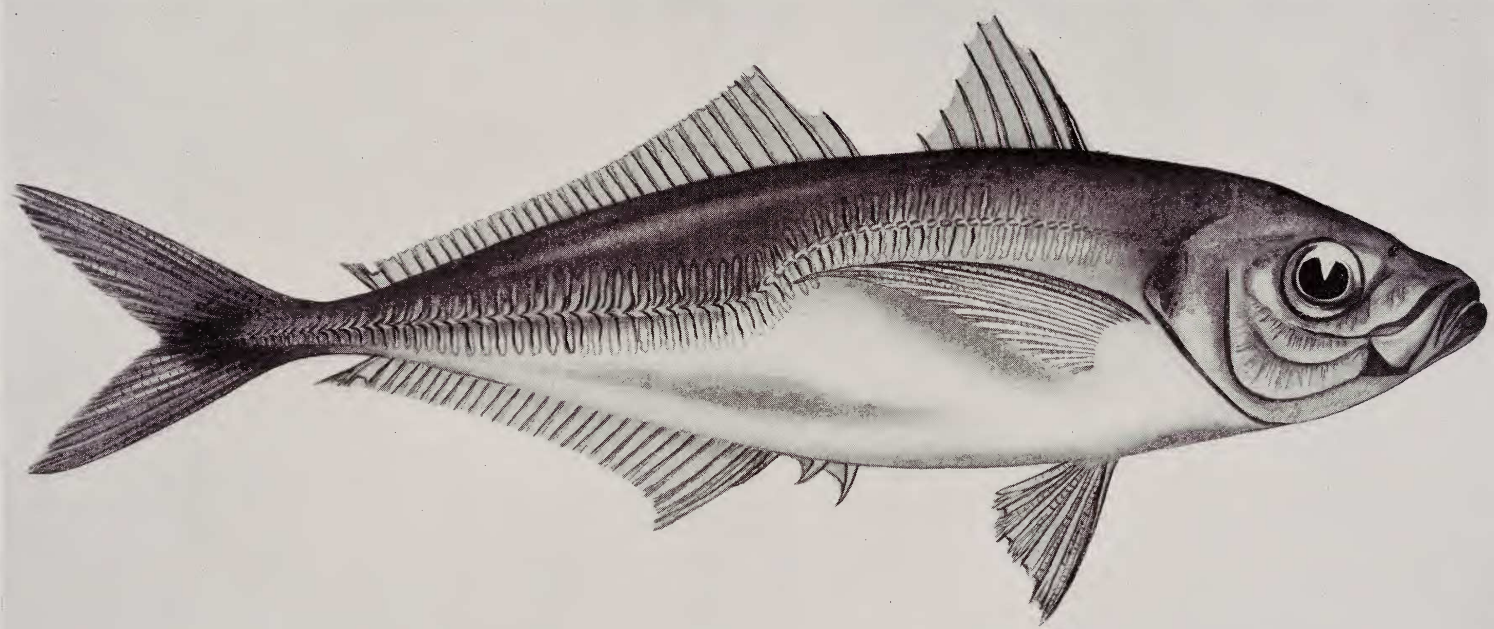


L. T. Griffin, del.]

Trachurus novae-zelandiae Richardson.

Horse Mackerel; Hature.

PLATE 18.

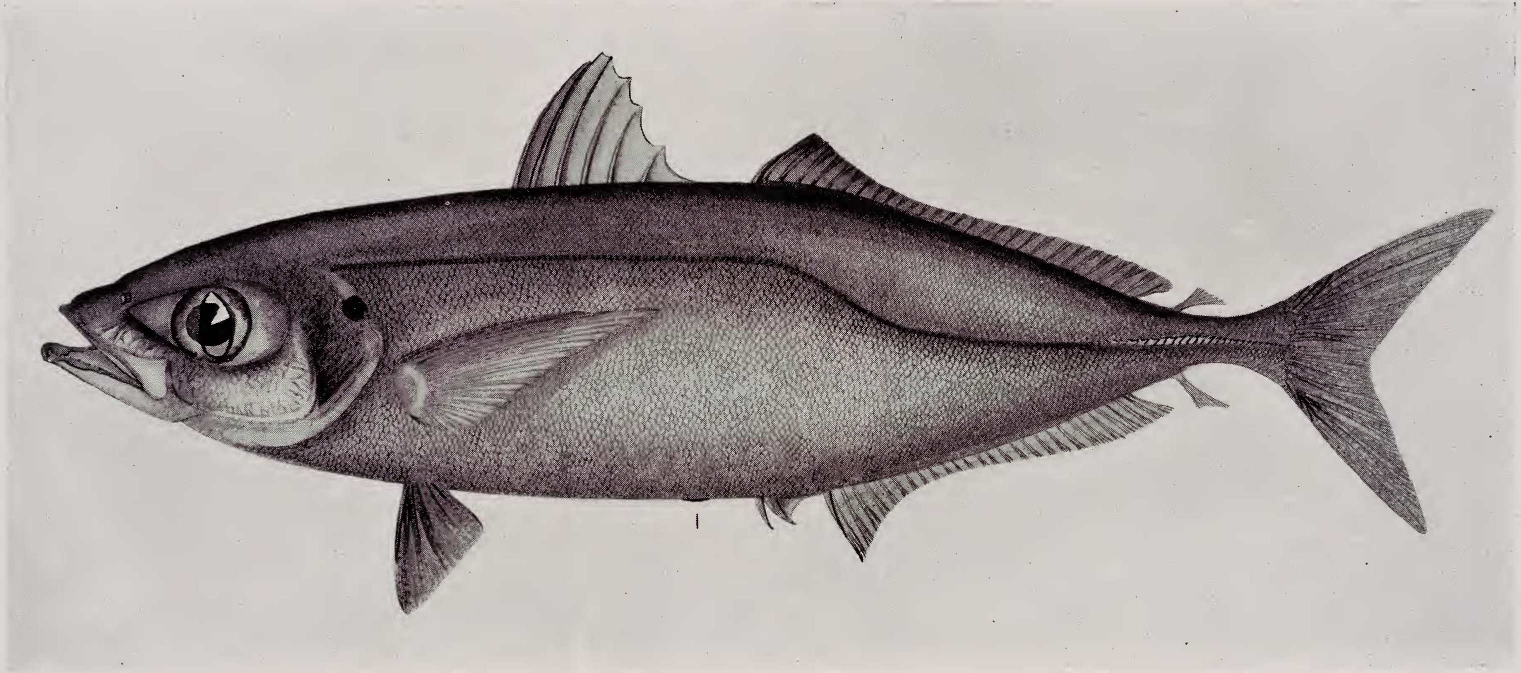


L. T. Griffin, del.]

Trachurus declivis (Jenyns).

Herring Scad.

PLATE 19.

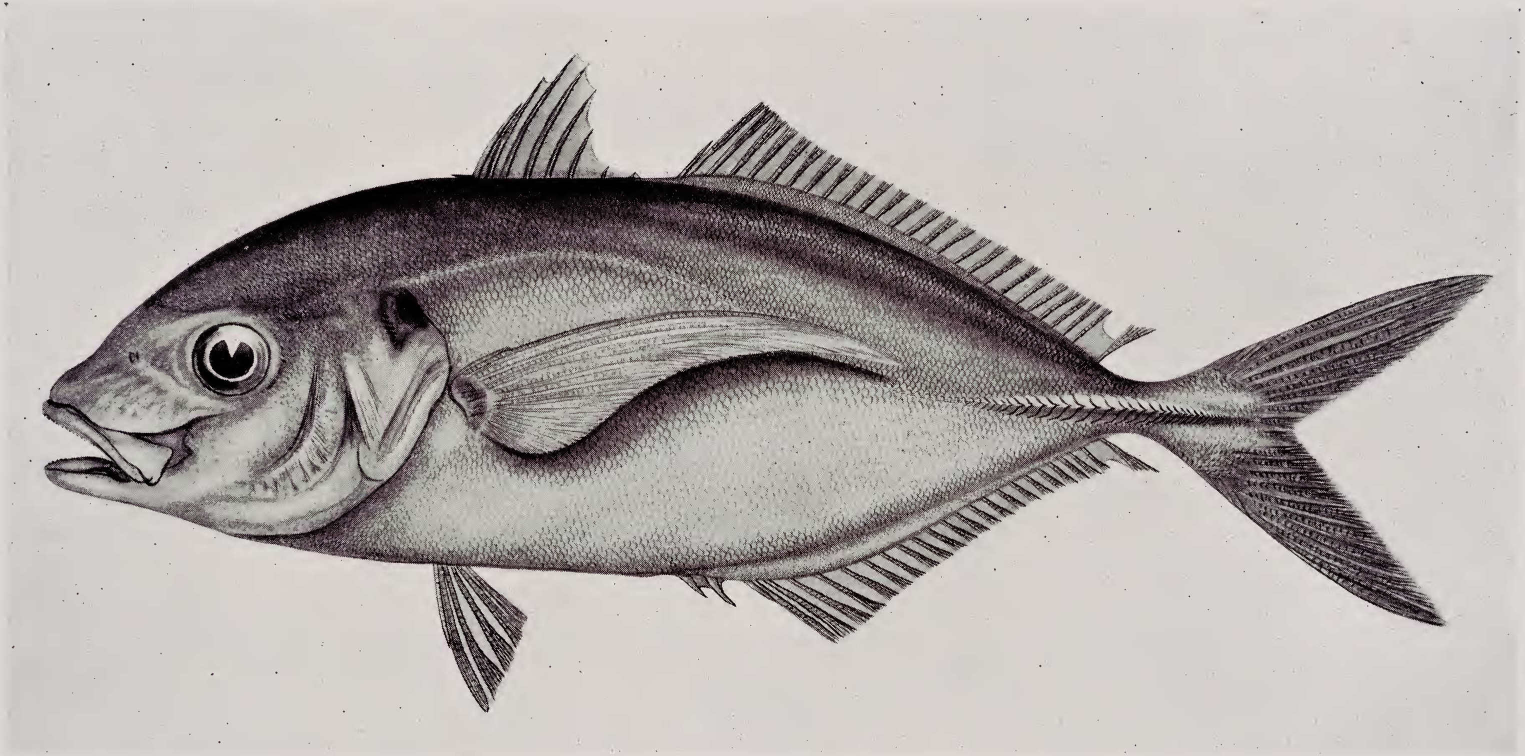


L. T. Griffin, del.]

Decapterus koheru (Hector).

Koheru.

PLATE 20.



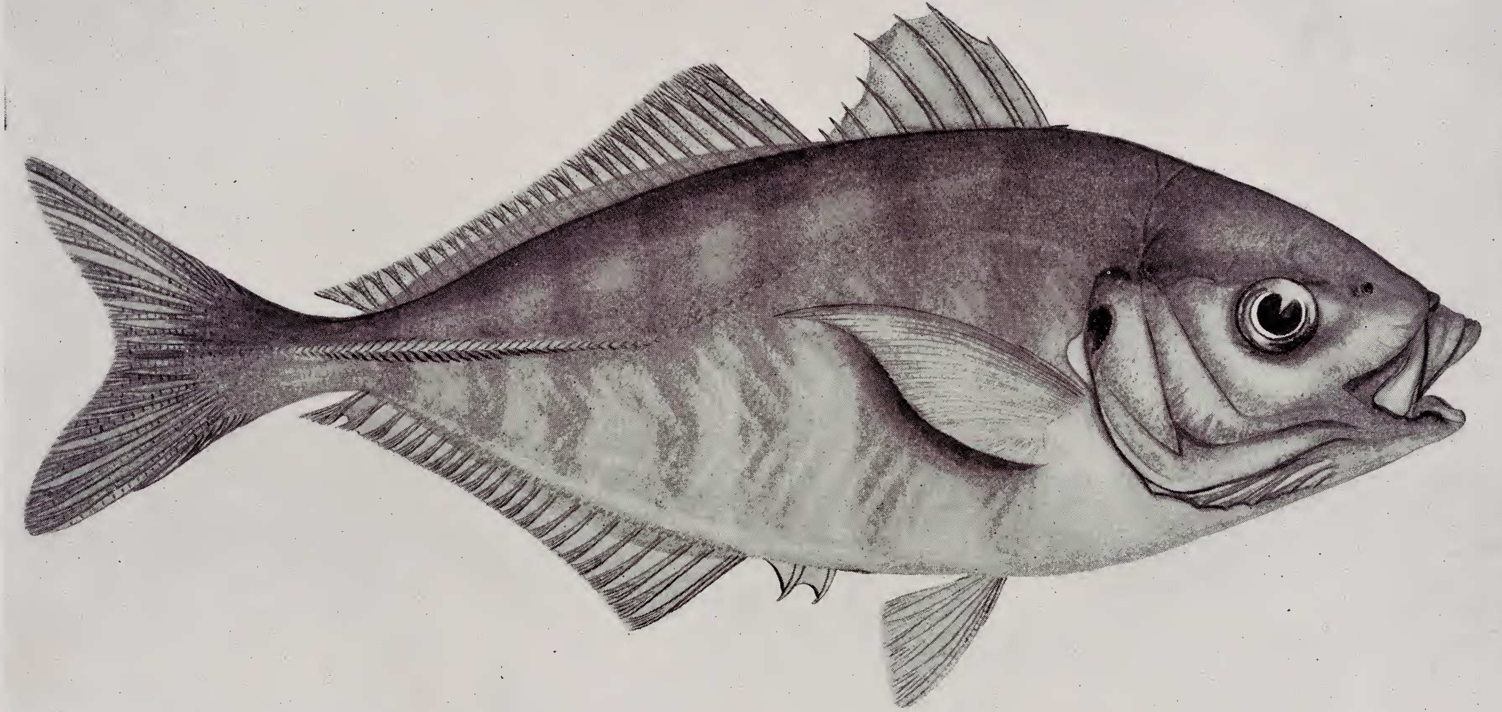
L. T. Griffin, del.]

Usacaranx lutescens (Richardson).

School Trevally; Araara.

PLATE 21.

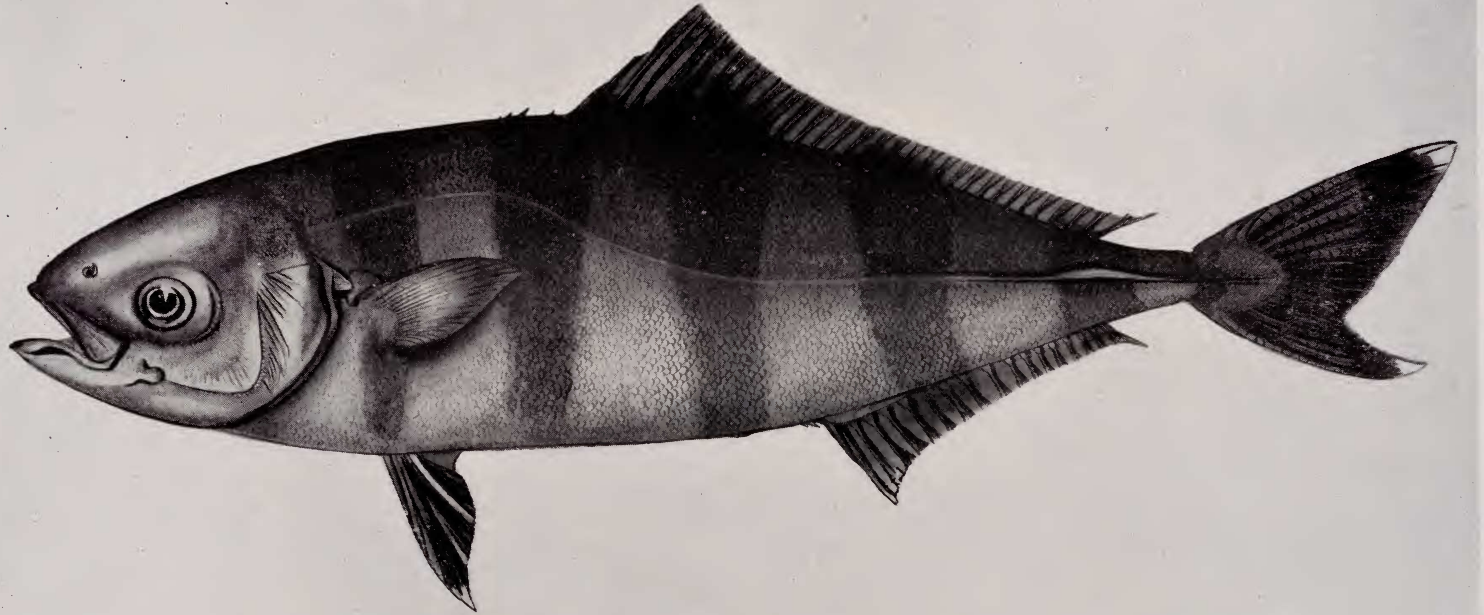
PLATE 22.



L. T. Griffin, del.]

Usacaranx archeyi n. sp.

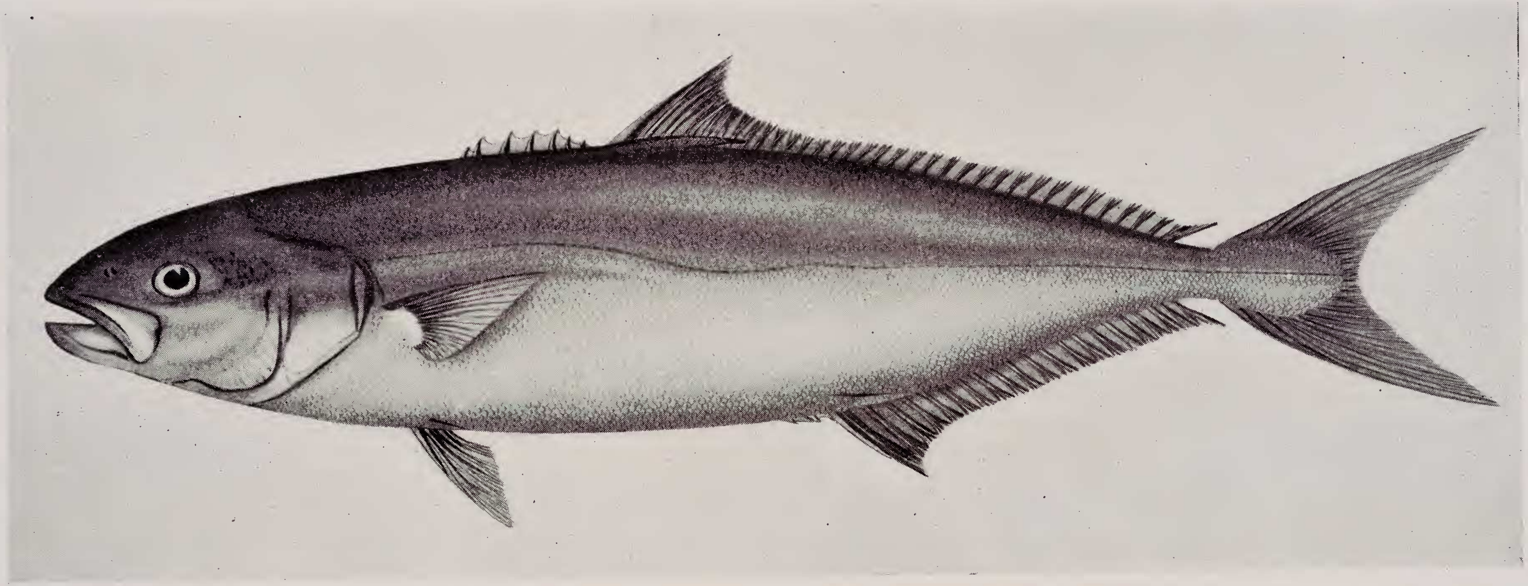
Plate 23.



L. T. Griffin, del.]

Naucrates angeli Whitley.

Pilot Fish.



L. T. *Griffin, del.*]

Regificola grandis Castelnau.

King Fish.

PLATE 24.